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May 25, 2012

Ms. Elizabeth Kudarauskas
U.S. Environmental Protection Agency Region 1
5 Post Office Square, Suite 100
Mail Code OES-04-2
Boston, MA 02109-3912

Re: Reporting Requirement under Section 114 of the Clean Air Act; Sprague Operating Resources LLC – Searsport, Maine Terminal

Dear Beth:

Sprague Operating Resources LLC ("Sprague") received a Reporting Requirement on March 31, 2012 from US Environmental Protection Agency ("EPA") requiring Sprague to provide information related to its #6 oil and asphalt equipment at its New England Terminals. EPA's has directed Sprague to respond to the Reporting Requirement for the Searsport, Maine terminal by May 31, 2012 and address the remaining terminals in the New England states by July 31, 2012.

Searsport Terminal Facility Background:

Sprague's Searsport Terminal, located at Trundy Road in Searsport, ME is a multi-use facility that handles bulk liquid cargoes, dry bulk products and special heavy lift projects. Among the bulk liquid cargoes, No. 6 oil and asphalt arrive at the Searsport terminal in marine vessels and transfer into the terminal's stationary storage tanks through vessel to tank pipelines. The relevant terminal assets include two No. 6 oil above ground storage tanks (ASTs); one of which is dedicated to $\leq 0.5\%$ sulfur No. 6 oil and the other to $\leq 2\%$ sulfur No. 6 oil. No. 6 oil is loaded from the storage tanks into tank trucks at a rack with three (3) loading positions. The terminal also operates an asphalt AST which is connected to a two-position rack system.

The terminal operates two boilers that burn 0.5% sulfur No. 6 oil (fuel oil) to generate steam to heat certain products and furnish heat to the office and facility buildings. The facility operates under an air license issued by the Maine Department of Environmental Protection (ME DEP) #A-97-71-H-R/A (SM; June 2, 2006), and License Amendment #1 (#A-97-71-I-M(SM); December 11, 2009) Specific Condition (#16) of the Air License limits No. 6 oil usage in the boilers to 1,000,000 gallons per year. The facility is designed and operated to handle heated products, including No. 6 oil (ASTs), asphalt, kaolin clay and caustic soda. Sprague maintains long term contracts for asphalt, kaolin clay and caustic businesses, while No. 6 oil is sold on short term or discretionary basis. The Air License includes the following ME DEP finding: "With the fuel limit on Boiler #1 and #2, the facility is licensed below the major source thresholds and is considered a synthetic minor."

Reporting Requirement – Part 1:

Part One of the Reporting Requirement instructs Sprague to provide the following information for the No. 6 oil and asphalt system at the Searsport Terminal:

1. Maximum daily, monthly and annual design throughput capacities for the facility with detailed description of how the maximum capacity was determined
2. Date of purchase and/or installation of each loading rack
3. Date each tank was put into service
4. Date each loading arm was put into service
5. Date any tank or loading rack was taken out of service

When determining the maximum capacity for No. 6 oil and asphalt at the Searsport terminal, Sprague looked at three limiting design factors: (1) vessel offloading, (2) rack loading and (3) heating capacity design limitations imposed by the MEDEP Air License limit on boiler fuel use. Sprague's ME DEP Air License limits the terminal's boilers' annual fuel use. The boilers provide the necessary heat to store and distribute the heated products along with furnishing the physical heat for the office buildings on site. Sprague is restricted by a federally enforceable condition of the Air License to burning no more than 1 million gallons fuel oil each year in the boiler system. This license restriction serves as the limiting factor on the maximum annual throughput capacity for No. 6 oil and asphalt at the terminal.

The maximum heat load of the boiler system, given the 1 million gallon annual restriction, was determined to generate 128.8 billion BTU's per year. In calculating the maximum physical product throughput capacity, the BTU's generated by the boiler system were apportioned across the heated products equipment which the facility is designed to operate, including the steam lines, dock lines, product lines to the rack and the product tanks. BTU's were also allocated towards cleaning the clay operations, the heat requirements for the physical facility and the physical condensate loss that is not re-circulated.

The most significant use of heat in this balance is from turning the No. 6 oil and asphalt tanks. Assuming the terminal operates its boiler system with 1,000,000 gallons fuel oil for the year, operates the facility as designed to satisfy its contract requirements for caustic and clay, and provides the necessary heat for the buildings on site, the maximum No. 6 oil throughput would be 2.7 million barrels annually. Alternatively, assuming the terminal satisfies its caustic, clay and building heating requirements as required by the facility design and normal operation, the maximum asphalt throughput would be 1.2 million barrels annually. In these cases, the No.6 oil and asphalt are mutually exclusive.

Daily and monthly throughput capacities are based on dock and rack capacities. See Attachment 1 for details on the analysis for the BTU, dock, and rack calculations as well as information required for Part One of the Reporting Requirement.

Reporting Requirement – Part 2:

Part Two of the Reporting Requirement instructs Sprague to provide the following information for the No. 6 oil and asphalt system at the Searsport Terminal:

> List of each capital project which involves purchase, storage, distribution or transportation of #6 oil and asphalt greater than $100,000 since 1990 providing the following information:
>
> 1. Project description
> 2. Purpose/function of the equipment
> 3. Cost and date of purchase
> 4. Date of installation
> 5. Date equipment began operating
> 6. Information pertaining to any emission control devices

This information is provided in Attachment 2. Note that for each of these projects, Sprague recorded the date of installation and first operation (items 4 and 5) as the same date since once the project is completed, operation immediately commences. Additionally, none of the #6 oil and asphalt tanks or systems has floating roofs or other emission control devices.

Please let me know if you have any comments or questions on this material as we collate the balance of the information for submission July 31, 2012. We expect to follow a similar format in our response to the Reporting Requirement for the remaining Sprague New England terminals that operate #6 oil and asphalt systems.

Regards,

Elizabeth Hernberg
Managing Director, HSE

cc: Mr. Paul Scoff, VP General Counsel, Sprague Operating Resources LLC
Mr. Burt Russell, VP Operations, Sprague Operating Resources LLC
Ms. Kristen Campbell, Manager HSE, Sprague Operating Resources LLC
Mr. Carl Dougherty, Director of Engineering, Sprague Operating Resources LLC

Searsport - Reporting Requirement

Question 1 (b-c)

Tank #	Product	Safe-Fill (bbls)	Safe-Fill (gals)	Date Operational/ In # 6 Oil Service	Date Operational/ In Asphalt Service
1	6 Oil (0.5% sulfur)	93,929	3,945,018	1949	
2	Asphalt	93,929	3,945,018	1949	2003
3	6 Oil (2.0% sulfur)	145,481	6,110,202	1957	
5	6 Oil (0.5% sulfur)	450	18,900	1990	

Lane #	Product	# of Positions	Fill Rate (gal/min)	Date Operational/ In # 6 Oil Service	Date Operational/ In Asphalt Service
1	#6 Oil	1	550	1949	
2	#6 Oil	1	400	1949	
3	#6 Oil	1	400	1949	
4	Asphalt	1	500		1949
5	Asphalt	1	500		1949

Assumptions: No. 6 Oil racks 2 and 3 discharging simultaneously will show reduced pump rates.
If operating alone, pump rates are 525 gal/min for Lane 2 and 500 gal/min for Lane 3

Attachment I

BTU Allocation - Scenario 2

BTU Output from Boilers	128,835,350,000	BTU/yr
Less:		
Boiler Make up - Water	6,792,256,578	
Heat Loss in Pipelines (High Pressure)	2,931,340,579	
Heat Loss in Asphalt Dock and Rack Lines	3,706,776,918	
Heat Loss in Tanks - Caustic	1,934,193,669	
Heat Loss in Buildings	1,540,170,936	
Cleaning Clay Railcars:	346,076,640	
Subtotal BTU Usage before Tank Turns	17,250,815,321	BTU/yr
BTUs Remaining to Heat Tanks to Turn	111,584,534,679	BTU/yr
BTUs Required per turn:		
Tank 2 - Heat to 310	352,842,410	
Tank 4 - Heat to 310	770,078,400	
Tank 2 - Heat Loss	8,191,136,042	
Tank 4 - Heat Loss	14,051,167,529	
# Tank Turns for Irving Contract	1.78	
Heat Required for Tank 4 - Iriving Contract	26,389,047,630	
Subtotal BTU Remaining for Tank 2	85,195,487,049	
Subtotal Tank 2 Requirements	8,543,978,452	
# Turns for Tank 2	13.06	turns/year
# Bbls Tank 2	1,226,715	Bbls/year
Maximum Annual Asphalt Volume	1,226,715	Bbls/yr
Monthly Throughput	102,226	Bbls/mo
Daily Throughput	3,361	Bbls/day

Attachment I

BTU Allocation - Scenario 1

BTU Output from Boilers	128,835,350,000	BTU/yr
Less:		
Boiler Make-up Water	6,792,256,578	
Heat Loss in Pipelines (Low Pressure)	2,269,124,788	
Heat Loss in # 6 Oil Dock and Rack Lines	2,172,105,072	
Heat Loss in Asphalt Dock Lines	3,551,738,058	
Heat Loss in Tanks - Caustic	1,934,193,669	
Heat Loss in Buildings	1,540,170,936	
Cleaning Clay Railcars:	346,076,640	
Subtotal BTU Usage before Tank Turns	18,605,665,741	BTU/yr
BTUs Remaining to Heat Tanks to Turn	110,229,684,259	BTU/yr
BTUs Required per Tank turns (both Tank 1 and 3):	9,609,752,177	
# Turns for Both Tanks	11.47	turns/year
# Bbls Tank 1 and 3	2,746,178	Bbls/year
Maximum Annual #6 Oil Volume	2,746,178	Bbls/yr
Monthly Throughput	228,848	Bbls/mo
Daily Throughput	7,524	Bbls/day

Attachment I
Dock and Rack Throuhgput Capacities

Dock Assumptions:

One petroleum vessel loading or discharging at the dock

Searsport stores #2 oil in tanks, loaded by vessel and discharged into vessel; once annually

#2 Oil Tank Capacity	750,000	Bbls
Vessel Size	105,000	
# Vessels per Turn	7.1	
Total # of No. 2 oil Vessels per year	14.3	

#6 Oil

Maximum Discharge Rate:	6,365	Bbls/hr
Vessel Size	50,000	Bbls
Operations between Vessels:		
Vessel Berthing Time - Inbound	2	hrs
Vessel Mooring, Inspection and PIC Conference	2	hrs
Hose Disconnection, Secure equipment	2	hrs
Subtotal Time between Vessels	6	hrs
Vessel Discharge	7.86	hrs
Total Time per Vessel Transfer	13.86	hrs
Hours per Year	8,760	hrs
Less #2 Oil Vessels per Year (2 tank turns)	198	hrs
# Vessel Transfers per Year	618	vessels

No. 6 Oil:		
Theoretical Annual Throughput	15,448,901	Bbls/yr
Theoretical Monthly Throughput	1,287,408	Bbls/mo
Theoretical Daily Throughput	42,326	Bbls/day

Asphalt

Maximum Discharge Rate:	4,095	Bbls/hr
Vessel Size	105,000	Bbls
Operations between Vessels:		
Vessel Berthing Time - Inbound	2	hrs
Vessel Mooring, Inspection and PIC Conference	2	hrs
Hose Disconnection, Secure equipment	2	hrs
Total Time per Vessel Transfer	6	hrs
Vessel Discharge	25.64	hrs
Total Time per Vessel	31.64	hrs
Hours per Year	8,760	hrs
Less #2 Oil Vessels per Year (2 tank turns)	198	hrs
# Vessel Transfers per Year	271	vessels

Asphalt:		
Theoretical Annual Throughput	14,206,506	Bbls/yr
Theoretical Monthly Throughput	1,183,875	Bbls/mo
Theoretical Daily Throughput	38,922	Bbls/day

Assumptions: Only one product vessel can discharge at the dock. Above calculations assume 1/2 time is No. 6 oil and 1/2 time is asphalt

Attachment I
Dock and Rack Throughput Capacities

#6 Oil

Discharge Rate (averaged) per position:	450	Gals/min
Truck Capacity	8,500	Gals
Truck Filling Operations		
Gate to parking at rack	6	minutes
Prepare for loading procedure at rack	10	minutes
Load product	19	minutes
Prepare transit	10	minutes
Exit/Paperwork	10	minutes
Total Time per Truck Fill (per rack)	0.9	hrs
Hours per Year	8,760	hrs
# Truck Fills per Year (all #6 oil racks)	28,727	trucks
Theoretical Annual volume - #6 Oil	5,813,823	Bbls/yr
Theoretical Monthly Throughput	484,485	Bbls/mo
Theoretical Daily Throughput	15,928	Bbls/day

Asphalt

Maximum Discharge Rate per position:	500	Gals/hr
Truck Capacity	7,700	Gals
Truck Filling Operations		
Gate to parking at rack	6	minutes
Prepare for loading procedure at rack	10	minutes
Load product	15	minutes
Prepare transit	10	minutes
Exit/Paperwork	10	minutes
Total Time per Truck Fill (per rack)	0.9	hrs
Hours per Year	8,760	hrs
# Truck Fills per Year (all #6 oil racks)	20,451	trucks
Theoretical Annual volume - Asphalt	3,749,416	Bbls/yr
Theoretical Monthly Throughput	312,451	Bbls/mo
Theoretical Daily Throughput	10,272	Bbls/day

Assumptions: No. 6 Oil racks 2 and 3 discharging simultaneously will show reduced pump rates.

Appendix
BTU Calculations

(5) Cleaning Clay Railcars:

Volume Water per Railcar	350	gallons
Final Water Temperature	140	°F
Initial Water Temperature	45	°F
# of Railcars per Week	24	
BTUs Hot Water per Year	346,076,640	BTUs/yr

(6) Heat Requirement per Tank Turn

#6 Oil Tanks - Raise Temp to 145°F:		
Desired Temperature	145	°F
Inlet Temperature	125	°F
Density #6 Oil	8.16	lbs/gal
Specific Heat #6 Oil	0.45	BTU/lb-°F
Tank 1	289,544,596	BTUs
Tank 3	448,458,276	BTUs
Subtotal #6 Oil Tanks	738,002,872	BTUs
#6 Oil Tanks - Heat Loss of Tank Exterior:		
Desired Temperature	145	°F
Outside Temp	45	°F
Tank 1	4,636,492,099	BTUs
Tank 3	4,235,257,206	BTUs
Subtotal #6 Oil Tanks	8,871,749,305	BTUs
Subtotal Heat Loss #6 Oil Tanks per Tank Turn	9,609,752,177	BTUs
Asphalt Tanks - Raise Temp to 310°F:		
Desired Temperature	310	°F
Inlet Temperature	290	°F
Density Asphalt	8.60	lbs/gal
Specific Heat Asphalt	0.52	BTU/lb-°F
Tank 2	352,842,410	BTUs
Tank 4	770,078,400	BTUs
Subtotal Asphalt Tanks	1,122,920,810	BTUs
Asphalt Tanks - Heat Loss of Tank Exterior:		
Desired Temperature	310	°F
Outside Temp	45	°F
Tank 2	8,191,136,042	BTUs
Tank 4	14,051,167,529	BTUs
Subtotal Asphalt Tanks	22,242,303,571	BTUs
Subtotal Heat Loss Asphalt Tanks per Tank Turn	23,365,224,381	BTUs

Appendix
Assumptions for BTU Calculations

ASSUMPTIONS:

Maximum Permit Fuel Usage	1,000,000	gallons per year
No. 6 Oil Heat Capacity (API Gravity 13.0)	151,571	BTU/gallon
Boiler Efficiency	85%	efficiency
Useable BTUs/year	128,835,350,000	BTUs per year by Permit

Latent heat of vaporization from 212 F is 15% Efficiency Loss <--- This is the factor that takes into account heat of vaporization

Number of Steam Heaters	2	
Low Pressure at 100 psi gauge Steam Temp	338	°F
High Pressure at 180 psi gauge Steam Temp	379	°F
City Water Temperature	45	°F
Average Temperature in Searsport, ME	45	°F

	Tank 1 (# 6 oil)	Tank 2 (asphalt)	Tank 3 (# 6 oil)	Tank 4 (caustic)	Tank 10 (caustic)	Irving Tank 4 (asphalt)
Diameter (ft)	120	120	150	85	85	175
Height (ft)	48	48	48	40	40	48
Capacity (Bbls)	93,929	93,929	145,481	40,000	40,000	205,000
Insulation (inches)	2	4	4	2	4	4
Roof Surface Area (ft^2)	11,309	11,309	17,671	5,674	5,674	24,052
Walls Surface Area (ft^2)	18,095	18,095	22,619	10,681	10,681	26,389
Subtotal Surface Area (ft^2)	29,404	29,404	40,290	16,355	16,355	50,441
Heat Loss ($°F/ft^2$ per hour)	0.18	0.12	0.12	0.18	0.12	0.12

Heat Loss on Piping: (Assumes 2" insulation)	0.18	($°F/ft^2$ per hour)
16" Piping	4.2	ft^2/linear ft
12" Piping	3.3	ft^2/linear ft
8" Piping	2.3	ft^2/linear ft
6" Piping	1.7	ft^2/linear ft

Irving Minimum Asphalt Throughput	365,000	Bbls/year

Appendix
BTU Calculations

CALCULATIONS:

(1) Boiler Make up - Water

Water usage in boiler (average per year)	4,876,762	gallons
Temp of steam	212	°F
Water density	8.34	lbs/gallon
BTUs Boiler Makeup	6,792,256,578	BTUs

(2) Heat Loss in Pipelines

Steam Lines:

Low Pressure: (#6 Oil Lines)		
Length of 8" pipe	1,795	ft
Length of 6" pipe	450	ft
Outside Temp	45	°F
Final Temp	338	°F
Heat Loss on 8" pipe	1,907,376,908	BTU/yr
Heat Loss on 6" pipe	361,747,879	BTU/yr
High Pressure: (Asphalt Line)		
Length of 8" pipe	2,420	ft
Outside Temp	45	°F
Final Temp	379	°F
Heat Loss on 8" pipe	2,931,340,579	BTU/yr
Subtotal Heat Loss on Steam Lines	5,200,465,367	BTU/yr

 # 6 Oil Lines:

Dock Line (16 ") Length	1,745	ft
Rack Line (8 ") Length - 2 Lines	1,250	ft
Outside Temp	45	°F
Final Temp of #6 oil	180	°F
Specific Heat Water	1.00	BTU/lb-°F
Heat Loss on Dock Line	1,560,109,572	BTU/yr
Heat Loss on Rack Lines	611,995,500	BTU/yr
Subtotal Heat Loss on #6 Oil Lines	2,172,105,072	BTU/yr

Asphalt Lines:

Dock Line (12") Length to Tank 2	1,445	ft
Dock Line (12") Extension Length to Tank 4	950	ft
Rack Line (8") Length	150	ft
Outside Temp	45	°F
Final Temp of Asphalt	330	°F
Specific Heat Water	1.00	BTU/lb-°F
Heat Loss on Dock Lines	3,551,738,058	BTU/yr
Heat Loss on Rack Lines	155,038,860	BTU/yr
Subtotal Heat Loss onAsphalt Lines	3,706,776,918	BTU/yr

Caustic Lines: NONE

Subtotal Heat Loss on Pipelines 11,079,347,357

Appendix
BTU Calculations

(3) Heat Loss in Caustic Tank

Caustic Temp	90	°F
Outside Temp	45	°F
BTU Requirement to raise/maintain temp in Caustic Tank 4	1,160,516,202	BTUs/yr
BTU Requirement to raise/maintain temp in Caustic Tank 10	773,677,468	BTUs/yr
Subtotal Caustic Tanks	1,934,193,669	BTUs/yr
Subtotal Heat Loss on Tanks	33,048,246,545	

(4) Heat Loss in Buildings

Office Building:

Office Length	55	ft
Office Width	62	ft
Office Height	10	ft
Roof Area	3,410	ft^2
Wall Area	2,340	ft^2
Roof Coefficient of Heat Loss	0.16	($°F/ft^2$ per hour)
Walls Coefficient of Heat Loss	0.33	($°F/ft^2$ per hour)
Outside Temp	45	°F
Average Temp of Interior	72	°F
Heat Loss from Roof	129,045,312	BTUs/yr
Heat Loss from Walls	182,640,744	BTUs/yr
Subtotal Heat Requirement for Office Building	311,686,056	BTUs/yr

Garage:

Garage Length	40	ft
Garage Width	100	ft
Garage Height	15	ft
Roof Area	4,000	ft^2
Wall Area	4,200	ft^2
Roof Coefficient of Heat Loss	0.16	($°F/ft^2$ per hour)
Walls Coefficient of Heat Loss	0.33	($°F/ft^2$ per hour)
Outside Temp	45	°F
Average Temp of Interior	72	°F
Heat Loss from Roof	151,372,800	BTUs/yr
Heat Loss from Walls	327,816,720	BTUs/yr
Subtotal Heat Requirement for Garage Building	479,189,520	BTUs/yr

Clay:

Clay Length	80	ft
Clay Width	120	ft
Clay Height	20	ft
Roof Area	9,600	ft^2
Wall Area	8,000	ft^2
Roof Coefficient of Heat Loss	0.18	($°F/ft^2$ per hour)
Walls Coefficient of Heat Loss	0.18	($°F/ft^2$ per hour)
Outside Temp	45	°F
Average Temp of Interior	72	°F
Heat Loss from Roof	408,706,560	BTUs/yr
Heat Loss from Walls	340,588,800	BTUs/yr
Subtotal Heat Requirement for Clay Building	749,295,360	BTUs/yr
Subtotal Heat Loss for Facility Heating	1,540,170,936	BTUs/yr

Searsport #6 Oil and Asphalt System Capital Projects Since 1990
> $100,000

Project Description	Purpose of the Project	Cost	Date In Service	Emission Control
Tank 1 Maintenance	#6 oil tank cleaned and inspected per API 653, coils were replaced.	$ 246,878	12/31/1999	N/A
Tank 3 Maintenance	#6 oil tank was cleaned and inspected per API 653. Floor repairs conducted and coils were replaced.	$ 374,036	11/1/2000	N/A
Tank 2 Maintenance	Replaced the bottom in Tank 2 (#6 oil).	$ 314,412	12/13/2002	N/A
Asphalt/#6 Oil Optimization	Rationalization project involving closure of Bucksport, ME Terminal reducing Sprague system residual fuel storage capacity: (1) Removed Bucksport Tank 1 and Tank 3 from service (2) Converted Searsport Tank 2 from #6 oil to asphalt service and replaced tank insulation with new 4 inch insulation (3) Replaced insulation in Tank 2 (4) Physically connected Irving Tank 4 to Sprague heat plant to provide steam per contract.	$ 1,100,000	6/30/2003	N/A
#6 Oil Pipeline Maintenance	Conducted repairs to the 16 in dockline that included a new section of pipeline, repairs to certain pipe supports and the replacement of some valves.	$ 123,272	12/24/2003	N/A
Blender, Piping,Tank Relocation	Additional system rationalization and relocation including: (1) Demolished #6 oil Tank 1 in Bucksport (2) Relocated the #6 oil blender from Bucksport to Searsport and installed under the rack. (3) Installed two vertical #2 oil tanks to enable of the blending of #2 oil with resdiual oil to make #4 and #5 oil blends.	$ 654,594	12/30/2004	N/A
Tank 3 Maintenance	Replaced some roof plates and reinsulated tank.	$ 655,261	12/31/2007	N/A

Note: Current Searsport configuration includes #6 oil Tanks 1 and 3, and Asphalt Tank 2 all of which are owned and operated by Sprague
Irving Oil owns the adjacent Asphalt Tank 4, to which Sprague supplies heat